

THE OFFICE ACTION

In the Office Action issued June 17, 2003, the Examiner rejected claims 17-19 under 35 U.S.C. §112, second paragraph, as purportedly being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. The Examiner also rejected claims 1-3, 6, 9, 12, 14, 15, 17, and 18 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,246,866 to Nasu et al. ("Nasu"). The Examiner rejected claims 1-4, 6, 8-10, 12, 14, 15 and 18 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,274,240 to Mathies et al. ("Mathies") in view of U.S. Patent No. 5,627,643 to Birnbaum et al. ("Birnbaum"). The Examiner also rejected claims 5 and 11 under 35 U.S.C. §103(a) as being unpatentable over Nasu in view of U.S. Patent No. 5,637,458 to Frankel et al. ("Frankel"). The Examiner rejected claim 19 under 35 U.S.C. §103(a) as being unpatentable over Mathies in view of Birnbaum and further in view of U.S. Patent No. 6,136,612 to Della Ciana et al. ("Della Ciana"). The Examiner also rejected claims 1-3, 6, 8, 9, 11, 12, 14, 15, 17 and 18 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,874,492 to Mackay ("Mackay"). The Examiner indicated that claims 7, 13, 16 and 20-26 were allowable.

THE EXAMINER INTERVIEW

On May 27, 2003 a telephonic interview between the Examiner and Applicants' representative was conducted. The parties discussed the patentability of the claims in light of the cited prior art. Specifically, the Examiner indicated that the term "single scan pass" still reads on the teachings of Nasu based on the Examiner's position that Nasu teaches taking a full image of the gel apparatus in each scan pass. Applicants indicated that they would review the matter once a formal Office Action was issued.

REMARKS

The Office Action has been carefully considered by the Applicants. The Applicants respectfully request reconsideration of the

application in light of the above amendments and the following comments. Claims 1-5, 7-11, 13 and 15-29 remain pending in the application.

The Examiner rejected claims 17-19 under 35 U.S.C. §112, second paragraph, as being indefinite. Specifically, the Examiner stated that claims 17-19 recite the illumination means and depend on claim 14, but claim 14 does not recite an illumination means. Antecedent basis is lacking. As amended, claims 17-19 now depend from claim 16 and further define the illumination means. Claim 16 specifically recites a means for illuminating the DNA fragments. Applicants therefore submit that sufficient antecedent basis is present and respectfully request withdrawal of the 35 U.S.C. §112 rejection.

With respect to the Examiner's 35 U.S.C. §§102 and 103 rejections, new claims 27 and 28 are original claims 1 and 9 that have been amended to recite an illumination source attached to the detector to detect light emitted from the DNA fragments. In the Office Action, the Examiner indicated that the prior art does not teach or suggest the claimed device wherein a laser is attached to the rear of the detector. Applicants submit that claims 27 and 28 are thus patentable over the cited prior art. Rejected claim 14 has been deleted and claim 15 now depends from claim 20, which the Examiner has indicated is allowable.

Independent claims 1 and 9 have been amended to recite that the detector comprises a full-width array scanner capable of scanning an entire width of the separation apparatus simultaneously. Support for this amendment can be found throughout the original specification as originally filed. Particular reference is made to the paragraph starting on page 9, line 27, which discusses Figures 5a-c and discloses a method of linear scanning an entire width of the separation apparatus by scanning in a direction that is parallel to the direction of the sample migration. In this respect, it is explained that "as the sample migrates through the capillary and separates, the linear detector will scan in the direction of the sample along the entire sequencing plate in order to receive data of the sample separation as or once it separates." (emphasis added). A similar effect is described in the paragraph starting on page 10, line 27, which discusses Figures 6a-c and discloses a method of linear scanning an entire width of the separation apparatus by

scanning in a direction that is perpendicular to the direction of the sample migration. In both cases, as the scanner moves while scanning a full width image of the separation apparatus. Such full width array scanners are used in document scanners and their operation as thus described are known (page 8, lines 20-26). Thus, applicants submit that the amendments to claims 1 and 9 present no new matter.

Nasu fails to teach such a full-width array scanner capable of scanning an entire width of the separation apparatus simultaneously. In this respect, applicants point to column 5, line 33-column 6, line 2. Here, Nasu specifically discloses radiating and detecting along an x-direction (perpendicular to direction of electrophoresis). Specifically, Nasu teaches rotating a mirror 12 along the x-direction to successively scan along this x-direction. This scanning takes place at a speed much faster than the speed of the DNA fragment migration in the y-direction (column 5, lines 46-51). The scanning along this x-direction is then repeated successively in the y-direction (column 5, line 68-column 6, line 2).

Thus, although the scanning in the x-direction is much faster than the DNA migration, scanning of the entire width of the gel does not occur simultaneously, as presently claimed. Rather, Nasu teaches scanning along the x-direction as the polygon mirror is rotated. Thus, Nasu fails to teach or suggest claims 1 or 9 or those dependent therefrom.

With regard to the Examiner's §103 rejections based on Mathies in view of Birnbaum, applicants submit that such a rejection must be withdrawn in view of the above amendments. Specifically, it cannot fairly be said that a combination of Mathies and Birnbaum discloses or suggests a full-width array scanner capable of scanning an entire width of the separation apparatus simultaneously. This is particularly true in light of the fact that Birnbaum only discloses a separation apparatus comprising a single capillary.

With regard to the Examiner's §103 rejection of claims 5 and 11 based on Nasu in view of Frankel, applicants submit that such a rejection must be withdrawn in view of the above amendments. Specifically, it cannot fairly be said that a combination of Nasu and Frankel discloses or suggests a full-width array scanner capable of scanning an entire width of the

separation apparatus simultaneously. This is discussed in detail above with respect to Nasu. Frankel also fails to disclose or suggest such a detector. Thus, any proposed combination of the two references fails to disclose or suggest this element as well.

With respect to the Examiner's rejection of claim 19 under §103 based on a combination of Mathies, Birnbaum and Della Ciana, claim 19 has now been amended to depend from claim 16, which the Examiner has already indicated as allowable. Thus, applicants submit that claim 19 is also allowable as amended.

With regard to the Examiner's rejection of claims 1-3, 6, 8, 9, 11, 12, 14, 15, 17 and 18 under §102(b) over Mackay, applicants submit that amendments now leave only claims 1-3, 8, 9, and 11 to discuss. With respect to these claims, applicants submit the noted rejection must be withdrawn in view of amendments to claims 1 and 9. That is, Mackay fails to disclose or suggest all of the elements of the present claims. Specifically, it cannot fairly be said that Mackay discloses or suggests a full-width array scanner capable of scanning an entire width of the separation apparatus simultaneously. In this respect, Mackay discloses the use of a charge coupled device (CCD). The full width array scanner of the present invention is distinct from and superior to such devices in that they have about 10 times the light throughput as compared to a CCD (see page 13, lines 6-17 of present application). Thus, applicants submit that Mackay fails to disclose or suggest the use of a full width array scanner.

Similarly, new claim 29 is identical to claim 7 except for the substitution of the recitation of a large area two dimensional image sensor array. Such large area two dimensional arrays are distinct from two dimensional CCD's. Thus, applicants submit that new claim 29 is patentable over the cited art as well.

Thus, Applicants submit that all pending claims now patentably recite over the prior art. Applicants respectfully request withdrawal of 35 U.S.C. §§102 and 103 rejections.

CONCLUSION

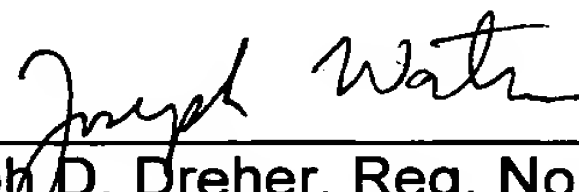
In view of the foregoing comments, Applicants submit that claims 1-5, 7-11, 13 and 15-29 are in condition for allowance. Applicants respectfully request early notification of such allowance. Should any issues remain unresolved, the Examiner is encouraged to contact the undersigned to attempt to resolve any such issues.

If any fee is due in conjunction with the filing of this response, Applicants authorize deduction of that fee from Deposit Account 06-0308.

Respectfully submitted

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